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Marine-Overwater Structure New/Replacement

The purpose of this document is to provide guidance and assistance when reviewing and permitting [hydraulic project applications](#) for new and replacement overwater structures (including docks, piers, ramps, floats, watercraft lifts, and buoys). The guidance provides the biologist with basic information to process an application.

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1. Application Receipt

Applications or pre-applications are submitted to [Aquatic Protection Permitting System](#) (APPS). The application and plans are reviewed in Olympia for statutory completeness under [RCW77.55.021](#). Once the application is accepted, the Habitat Biologist reviews and processes the application within APPS. There are many training [videos](#) and [self-help](#) documents for this process located on SharePoint.

2. Office Review

Purpose

The office review allows the biologist to become familiar with the project details, location, and determine if the project was designed to meet WAC. The biologist must be knowledgeable on [RCW 77.55](#), [WAC 220-660](#), and [WAC 220-660-380](#) since the RCW and WAC are where the agency's authority comes from. The biologist should also be very familiar with the [Overwater Structures and Non-Structural Piling White Paper](#) and the [Overwater Structures: Marine Issues](#). Presence of fish life, including the species present, strongly influences proper project design. During the review, the biologist may consult literature, local reference materials, fish use data,


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and local experts to determine if the application is appropriately designed or if additional information is needed.

Tools and Resources

Data for reviewing hydraulic projects comes from a variety of sources and may come from government agencies (local County GIS), Non-Governmental Organizations (Wild Fish Conservancy Maps), as well as private sources of information. Most of this data is available either through the WDFW GIS database or through various internet websites. Other data may be in the form of hardcopy records acquired over time or from coworkers in the agency. All of this information is useful in preparing, but ultimately nothing replaces getting out on the ground for projects. Below is a list of commonly used resources:

- WDFW Publications – [Aquatic Habitat Guidelines](#)
- [WDFW Forage fish map](#) - Documented spawning locations of Pacific Sand Lance, Surf Smelt, and Pacific Herring. The measuring tool is useful for identifying distance to documented beaches and for measuring fetch. Forage fish are identified as critical species which are important prey for salmonids and marine mammals. Timing provisions should be included for both beach spawning forage fish (surf smelt and sand lance) and for off-shore (pacific herring) forage fish if they may be impacted by construction activities (e.g. barge operations, pile driving/removal, etc.).
- [WDFW PHS on the web](#) - Known location of priority habitats and species (PHS). PHS may identify other species of importance (PHS shellfish, marbled murrlets, rock fish and lingcod settlement and nursery areas) where construction activities should be prevented or limited. Identification through PHS of bald eagle/great blue heron rookeries for which we may request the voluntary application of timing windows (as the HPA can only protect for fish life unless we comment during State Environmental Policy Act [SEPA] review).
- [Eelgrass/Macroalgae Habitat Interim Survey Guidelines](#) - Not required for replacement within existing footprint. Necessary for new structures or expansion of existing structures in order to perform mitigation sequencing.
- WDFW ArcMap - Includes all data above with a previously issued HPA layer.
- ArcView - WDFW possesses various GIS data sets that include DNR water typing, fish passage barrier inventories, culvert inventories, fish distribution, LIDAR topography, etc. WDFW has created an ArcView project file that allows a biologist to view most if not all of our GIS data. If you are not set up to use this system, work with your supervisor to do so.
- [Department of Ecology](#) - maintains a variety of data including:
 - [The Water Quality Assessment and Clean Water Act 303\(d\) list](#)
 - [Coastal Atlas](#) - detailed shoreline imagery.
- [Department of Natural Resources](#) - There are many data layers on the DNR website that you can download and use on ArcGIS. These include fish

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passage barriers, water typing layers, forest roads, soil types, and many more.

- [DNR Eelgrass map](#) – Spatially limited but good data for documented beds. This is important if a barge is going to be used to bring in material or equipment.
- County Assessor’s parcel search - Most if not all counties in the state maintain a GIS database of parcel information in their county. County permit information, past violations, county planner assigned to project, parcel data (i.e. King County i-Map, Snohomish County Online Property Information, etc.) are sometimes available.
- Google Maps, Google Earth, and Bing Maps (provides birds eye view) - site context, local characteristics, neighboring properties, potential equipment access (barge vs upland), estimation of Ordinary High Water Line (OHWL), upland vegetation, and vicinity of upland structures.
 - <https://www.google.com/maps/>
 - <https://www.google.com/earth/>
 - <http://www.bing.com/mapspreview>
- Tides and Currents program- Provides the localized elevation for Mean Higher High Water (MHHW) Line.


Resource Information

- Consultant/Agent Biological Evaluation (BE) – Used for Endangered Species Act (ESA) review and habitat information.

3. *Missing Information*

Biologist may require more information at this time or after the site visit in order to evaluate the project. Examples include a bathymetry survey (to justify proposed pile diameter, pier length, etc.), specifications of proposed materials (i.e. percent open space for grated decking, type of wood used, etc.), detailed planting plan, enhancement plan to mitigate for new impacts, a Biological Evaluation (if available), and/or eelgrass survey.

The biologist should be timely in requesting additional information. Any needed additional information should be requested within 10 days after receiving the complete application. If information needed to issue a permit is not provided, the agency may deny the application or the applicant may put it on hold before the end of the 45-day processing period. If these situations occur, you should be working closely with your supervisor to avoid conflicts.

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4. Site Visit

Purpose

Site reviews typically occur as a pre-application review or the review of an active application in APPS. During a pre-application meeting, the objective of the biologist is to assist the landowner or agent. This typically occurs in the form of helping them determine appropriate design options and project scope. The biologist should also discuss mitigation and what might be required depending on the impacts of the final project proposal. This is a great time to let the applicant know what will need to be included in their application for it to be considered complete and for you to issue a permit. After a pre-application review, in most cases, another field visit is not necessary. Additional assistance can be found on WDFW's website [here](#).

When processing a formal application, the purpose of the site review is to verify structural measurements, appropriateness of the project proposal, determine project impacts, and appropriate mitigation. The biologist may find the design is inappropriate for the protection of fish life and must provide suggestions for modifying the plans or suggesting an entirely different design.


Safety Highlights

Vehicles must be parked in a safe place to not create a hazard for WDFW staff or the public. Site reviews often involve working around deep and/or flowing water which may present a drowning hazard; therefore a PFD may be necessary to maintain a safe working environment. Be sure to check in/out with a co-worker or supervisor if going to a site visit on your own.

Field Equipment and Tools

In addition to the basic safety equipment, staff should also bring the tools and equipment listed below. Conditions on site will dictate which equipment is used during the field visit.

- Business card or other agency ID
- Copy of application and plans
- iPad or other mobile device
- Camera
- GPS
- Tape measure
- Field notebook
- Knee or Hip boots
- Rain gear and/or other appropriate field clothing
- Personal Floatation Device (PFD)
- Disinfection supplies

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Verifying application information on site

Once on site, the biologist should offer the applicant or agent time to explain their design proposal and what they wish to accomplish. This initial conversation may yield useful information that may later facilitate discussion if there are problems identified in the design proposal.

- Verify information assembled from the office review.
- Identify the OHWM and determine the intersection point of the pier with the upland. Want the point to be as high as possible and landward of OHWM. [WAC 220-660-380\(4\)\(a\)](#).
- Ascertain if the site allows for opportunities to reposition the new or replacement structure to avoid and minimize impacts to critical habitat (eelgrass). Can the structure be repositioned to allow for eelgrass recovery if there are existing impacts? (This cannot be required; however, relocation of the structure should be mentioned as an option where appropriate).
- Confirm MHHW matches the plans and datum (construction waterward of MHHW is within U.S. Army Corps of Engineers jurisdiction, see Attachment 1) (<http://www.nws.usace.army.mil/Missions/Civil-Works/Regulatory/Permit-Guidebook/Corps-Permit/Limits-of-Jurisdiction/>)
- Determine length of existing and proposed structure.
- Document with photos and enter in APPS site inspection log and/or project file.


Identify Project Impacts and Mitigation Opportunities

- Identify vegetation to be impacted intertidally (cannot protect non-native species such as Japanese eelgrass, *Zostera japonica*).
- Identify non-native or mature native plants, what species, age class, how many?
- Identify access and work zone impacts (barge grounding, spud piles, pile driving methods).
- If a barge is used for construction, an eelgrass survey and/or barge operation plan should be submitted.

5. Mitigation Determination

Always keep in mind mitigation is based on existing conditions and must be adequate to ensure no net loss of habitat function due to impacts of the project.

Discuss mitigation measures onsite with applicant/agent if obvious during the site visit or after the site visit if additional information or time is needed to evaluate the project. Be sure to keep the applicant/agent engaged in your review process and be

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sure they are aware if compensatory mitigation may be needed to mitigate unavoidable impacts. Guidance may include both agency and regional documents including [State of Washington Alternative Mitigation Policy Guidance For Aquatic Permitting Requirements from the Departments of Ecology and Fish and Wildlife; Mitigation for better projects.](#)


Discuss

- Project impacts to fish and fish habitat.
- Project design and alternatives – as needed.
- Construction techniques proposed and alternatives – as needed.
- Mitigation measures for impacts to fish and fish habitat.
- A new overwater structure, or a replacement structure outside the previously approved footprint will require an eelgrass and macroalgae survey (WAC 220-660-350) <http://wdfw.wa.gov/publicatios/00714>

6. Rules of Thumb

Once you have drafted the permit in APPS, it is okay to share a draft and supporting documents with the applicant for review, if there is time. When conducting a site review always keep in mind potential impacts to:

- Salmon migration corridor – what are the impacts? Grounding blocks migration corridor and potentially impacts epibenthos.
- Shade effect – forces juvenile salmon out of their preferred migration pattern, potentially forcing them into deeper water and increasing risk of predation.
- Macroalgae – provides epibenthic habitat, so need to limit shading.
- Saltmarsh – high intertidal vegetation, provides detritus (food) for epibenthic production
- Eelgrass habitat – refuge and feeding
- Forage fish habitat - cobble, gravel, hardpan, sand. This will be to help determine if the site has a possibility of forage fish if not documented.
- When time and workload allow, it is strongly recommended that a post-construction compliance inspection is scheduled with the applicant and/or agent. The purpose of this inspection is to ensure the project was constructed according to the permit conditions required for the protection of fish-life. Large, complex, or high risk projects should be prioritized for inspection. Additionally, any project that implements novel, nonstandard construction techniques or structures should be inspected. This compliance inspection should be done preferably when the contractor is still on site so as to correct any issues and be recorded in APPS or other permitting databases in a timely fashion.

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7. Relevant WACS

- [WAC 220-660-310](#) - Tidal reference areas
- [WAC 220-660-320](#) - Saltwater habitats of special concern
- [WAC 220-660-330](#) - Authorized work times in saltwater areas
- [WAC 220-660-340](#) - Intertidal forage fish spawning surveys
- [WAC 220-660-350](#) - Seagrass/macroalgae habitat surveys
- [WAC 220-660-360](#) - Common saltwater construction provisions
- [WAC 220-660-380](#) - Residential and public recreational docks, piers, ramps, floats, watercraft lifts, and buoys in saltwater areas

8. Example Designs

Plans for overwater structures have their own set of challenges. Ultimately the written plan in APPS and the information on any drawings needs to support a project that meets our standards for the protection of fish life. See Attachment 2 for Example Plans.

9. References

Nightingale, B. and C. A. Simenstad. 2001, Overwater structures: Marine Issues (White Paper). Washington State Department of Transportation Report number WA-RD 508.1 Prepared for Washington State Transportation Center, University of Washington, Seattle, Washington. 133 plus appendices

Jones and Stokes. 2006. Overwater Structures and Non Structural Piling (White Paper). Prepared by Jones and Stokes Associates, in association with Anchor Environmental, L.L.C., and R2 Consultants for the Washington Department of Fish and Wildlife, Olympia, Washington

Poston, T. 2001. Treated Wood Issues Associated with Overwater Structures in Marine and Freshwater Environments White Paper. Olympia, Washington: Washington Department of Fish and Wildlife, Washington Department of Ecology, and Washington Department of Transportation



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10. Saltwater Flow Chart Overwater Structures

**WAC 220-660-380
Residential and Public Recreational Pier, Ramp, Float (PRF)
New Structure**

Replacement projects (see page 4) are those PRF completed within original footprint. Replacement of more than 33% or 250 sq. feet decking or replacement of decking requires functional grating

PRF not within the original footprint or structure absent and not usable for greater than one year = **NEW**

New Structure -Pier and ramp design (See Below)

New Structure -Perform Preliminary Eelgrass/Macroalgae Survey (See Page 3)

Pier and Ramp Design must, wherever feasible, span the intertidal area. Bottom of pier must be six feet above the bed at landward end

Residential Pier and Ramp

Public Recreational Pier and Ramp

Limit width of residential piers to no more than six feet. Limit width of residential ramps to no more than four feet. Cover entire ramp surface with grating

Limit the width of public recreational piers to the minimum width needed to accommodate intended use. Limit the width of public recreational ramps to the minimum width needed to accommodate intended use. Cover the entire ramp surface with grating

North/south oriented piers greater than 4 feet in width must have at least 30% of entire deck surface covered in functional grating. The grating must be installed parallel to length of pier for the entire length of the pier.

East/west oriented piers must have at least 50% of the entire deck surface covered in functional grating regardless of width. The grating must be installed parallel to width of pier, evenly spaced along the entire length of the pier.

If minimum deck surface covered in grating then open area = 60%

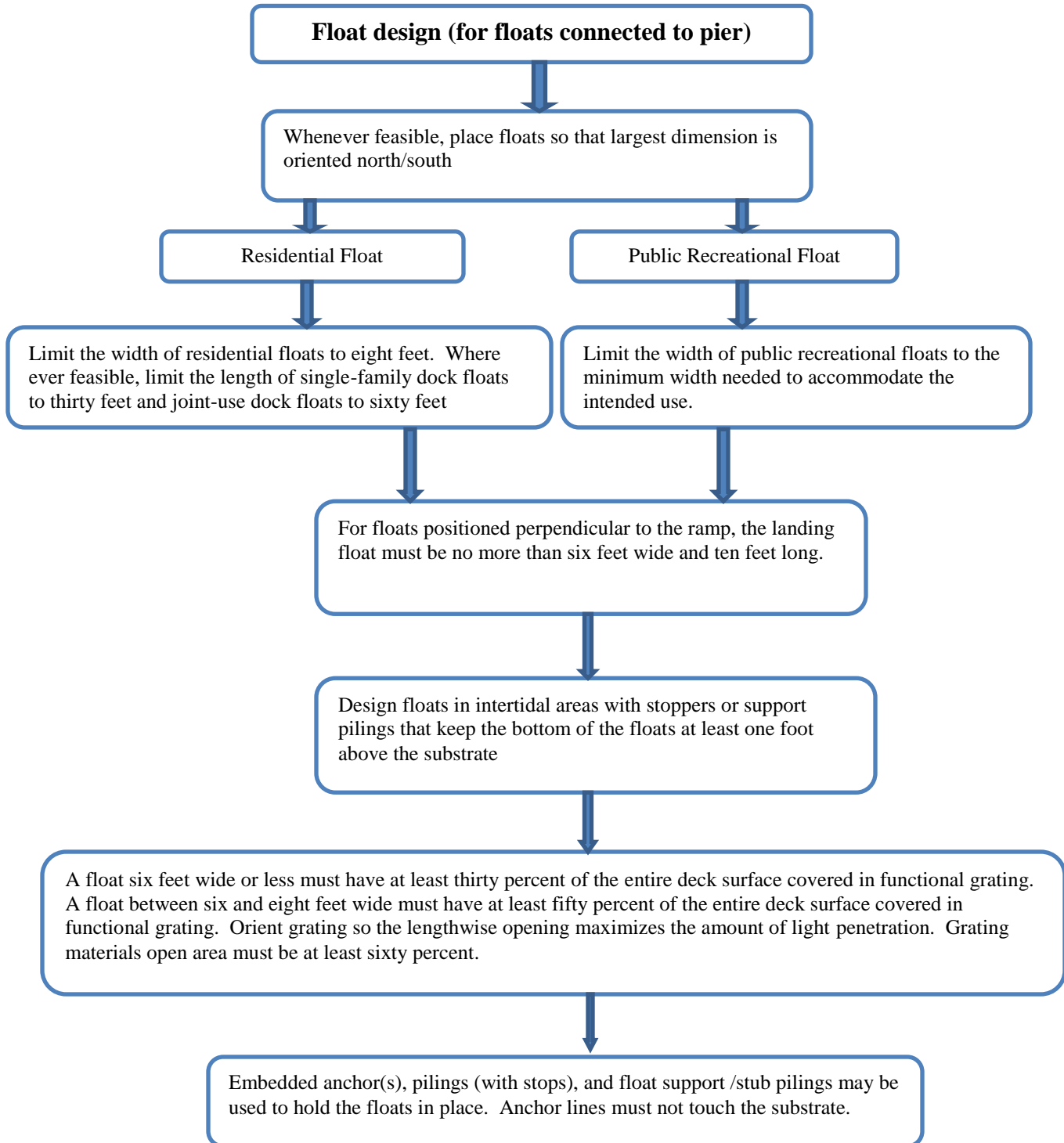
If grating covers more than minimum then open area = 40%

If minimum deck surface covered in grating then open area = 60%

If grating covers more than minimum then open area = 40%



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NEW STRUCTURE
Preliminary Eelgrass/Macroalgae Survey required.

Eelgrass/macroalgae absent
within project area

Eelgrass/macroalgae present
within project area

Proceed with project

Buffer Requirement: Structure must be located at least 25 feet (measured horizontally from the nearest edge of the structure) and 4 vertical feet (measured at extreme low water) from seagrass and kelp beds and from macroalgae beds if project is within a documented herring spawning area.

Structure can be positioned to meet
the buffer Requirement

Structure cannot be positioned to meet buffer
Requirement from eelgrass/kelp/macroalgae

Proceed with project

Department-approved, advanced eelgrass/macroalgae
survey required.

Applicant submits a Department-approved monitoring and compensatory mitigation plan as a condition for project approval. (Project impacts can be calculated as the total area of eelgrass/macroalgae affected by the project and applicant proceeds with advanced mitigation, or project impacts can be monitored to determine eelgrass/macroalgae loss and required mitigation.)

Mitigation plan is adequate
to compensate for impacts

Mitigation plan is
inadequate to compensate
for impacts

Proceed with project

Recommend project be denied



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**WAC 220-660-380
Residential and Public Recreational Pier, Ramp, Float (PRF)
Replacement Structure**

Structures within original footprint = **REPLACEMENT**
Replacement of more than 33% or 250 sq. feet decking or replacement of decking substructure requires functional grating in replaced section only

Grating Requirements per structure orientation

North/south oriented piers greater than 4 feet in width must have at least 30% of entire deck surface covered in functional grating. The grating must be installed parallel to length of pier for the entire length of the pier.

East/west oriented piers must have at least 50% of the entire deck surface covered in functional grating regardless of width. The grating must be installed parallel to width of pier, evenly spaced along the entire length of the pier.

If minimum deck surface covered in grating then open area = 60%

If grating covers more than minimum then open area = 40%

If minimum deck surface covered in grating then open area = 60%

If grating covers more than minimum then open area = 40%



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Replacement Float design (for floats connected to pier)

Afloat six feet wide or less must have at least thirty percent of the entire deck surface covered in functional grating. Afloat between six and eight feet wide must have at least fifty percent of the entire deck surface covered in functional grating. Orient grating so the lengthwise opening maximizes the amount of light penetration. Grating materials open area must be at least sixty percent.

Piling Design: Replacement and New

Use the smallest diameter and number of pilings for a sage structure. Wood piles replaced with steel typically require fewer piles

Steel pilings used to construct residential docks should not exceed twelve inch diameter. For public recreational docks limit the diameter of steel piling to the minimum diameter needed to accommodate the intended use.

New and replacement piling can be steel, concrete, recycled plastic, or untreated or treated wood approved by the Department. No creosote or pentachlorophenol is allowed

Treated wood piling must incorporate design features to minimize abrasion of the piling from contact with vessels, floats, or other objects

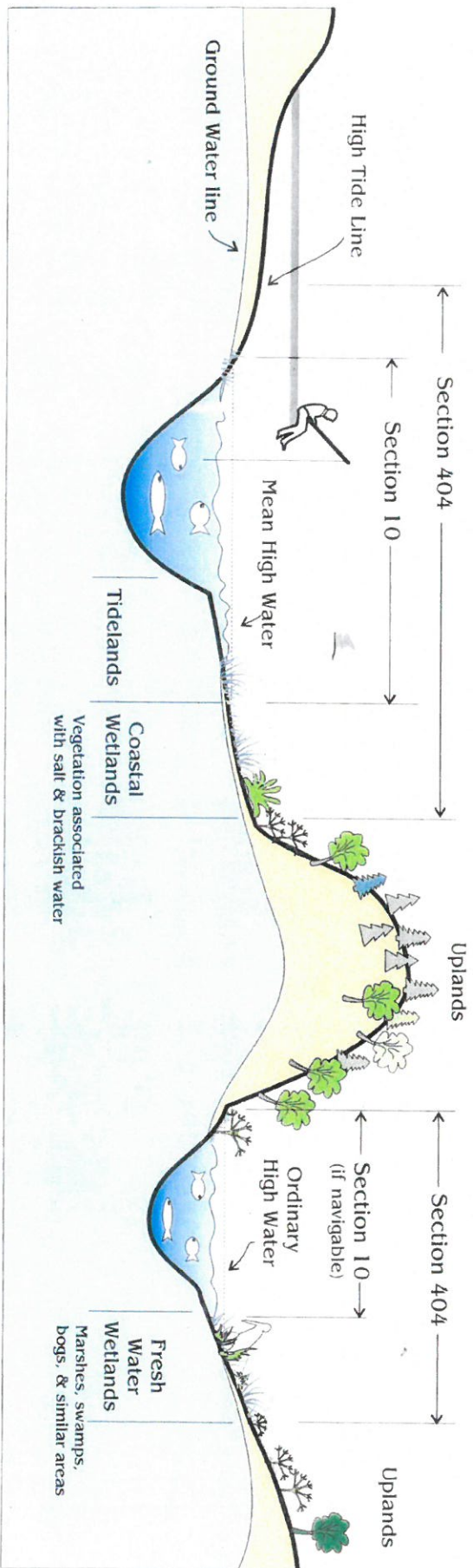
Attachment 1

U.S. Army Corps

CORPS OF ENGINEERS REGULATORY JURISDICTION

Tidal Waters

Fresh Waters



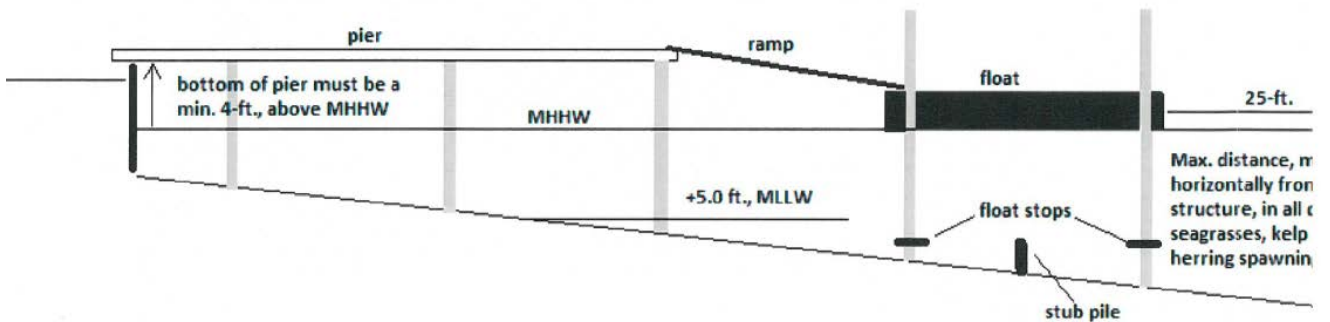
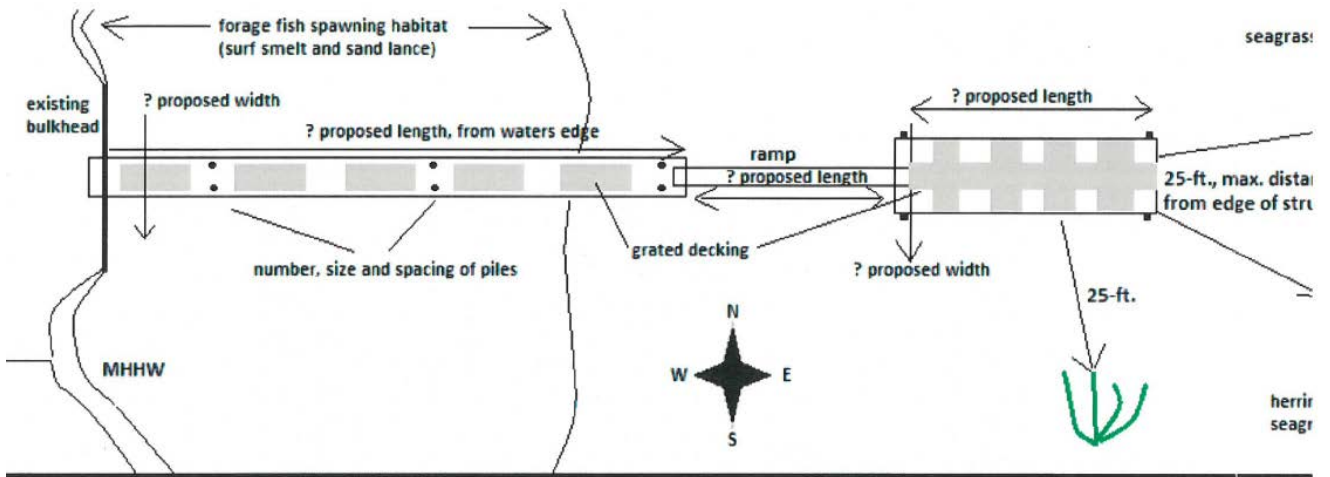
Section 103
 Ocean Discharge
 of Dredged Material
 Typical examples
 of regulated activities
 Ocean discharges of
 dredged material

Section 404
 Disposal of Dredged or Fill Material
 (all waters of the U.S.)
 All filling activities, utility lines, outfall structures,
 road crossings, beach nourishment, riprap,
 jetties, some excavation activities, etc.

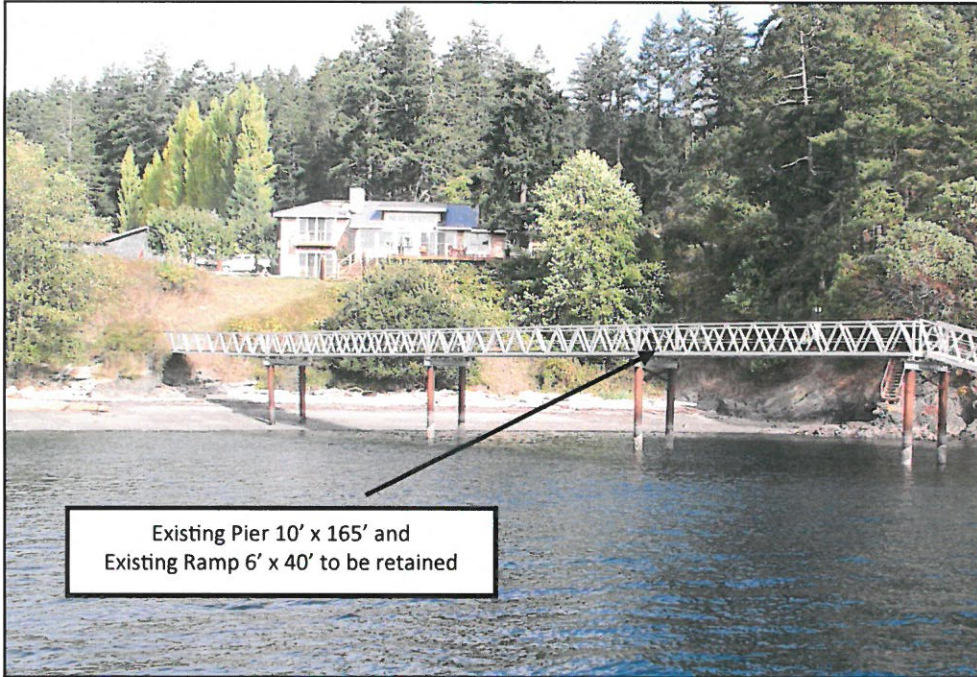
Section 10
 All Structures and Work
 (navigable waters)
 Dredging, marinas, piers, wharves,
 floats, intake / outtake pipes,
 pilings, bulkheads, ramps, fills,
 overhead transmission lines, etc.

Attachment 2

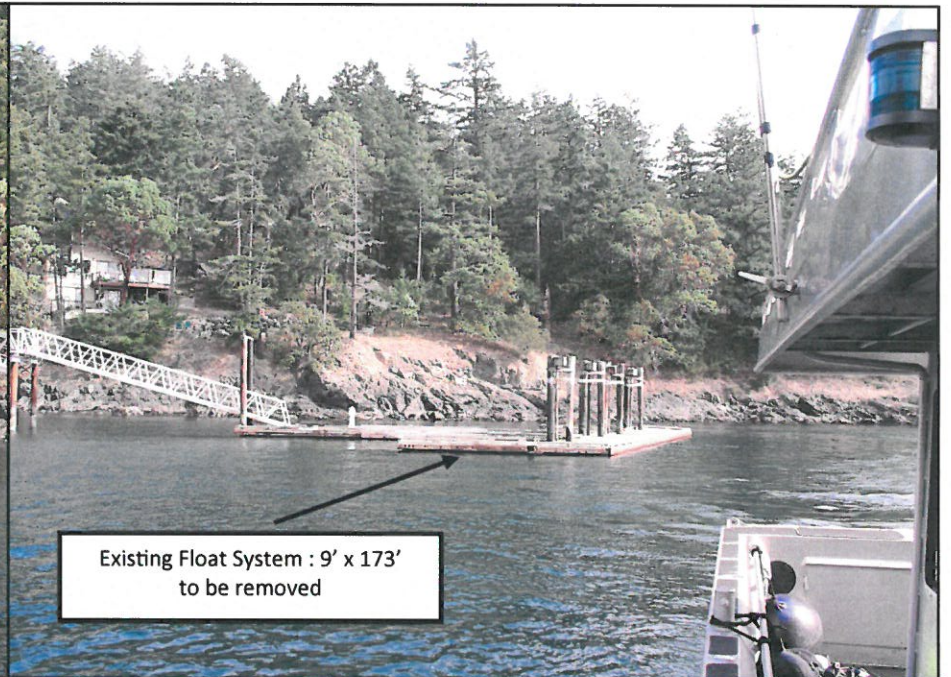
Example Plans



Example plans from a small overwater structure project.



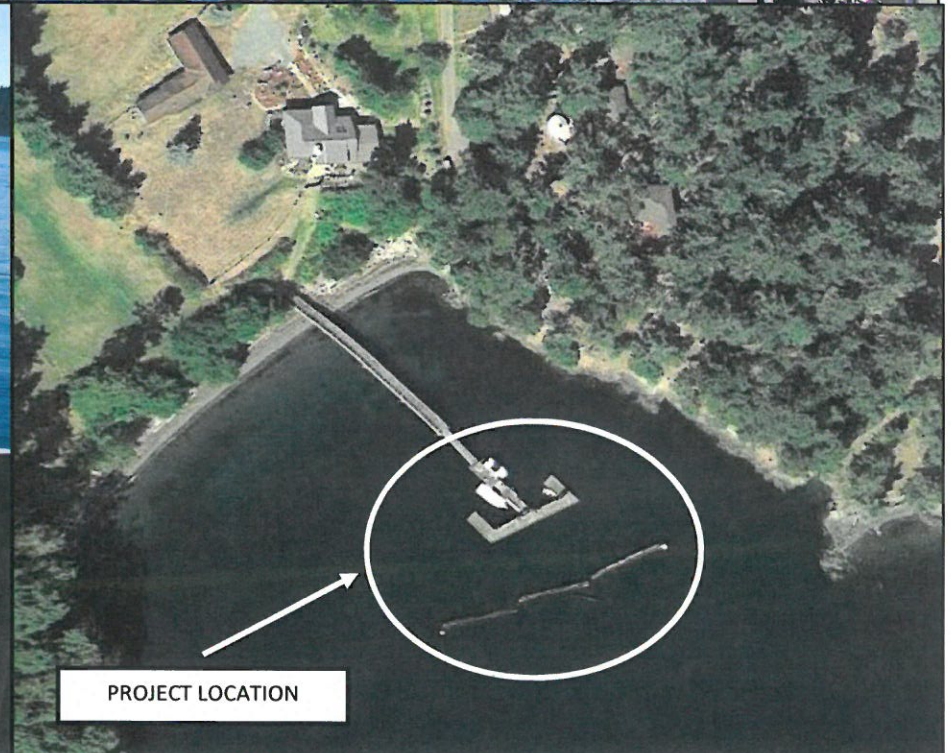
Existing Pier 10' x 165' and Existing Ramp 6' x 40' to be retained



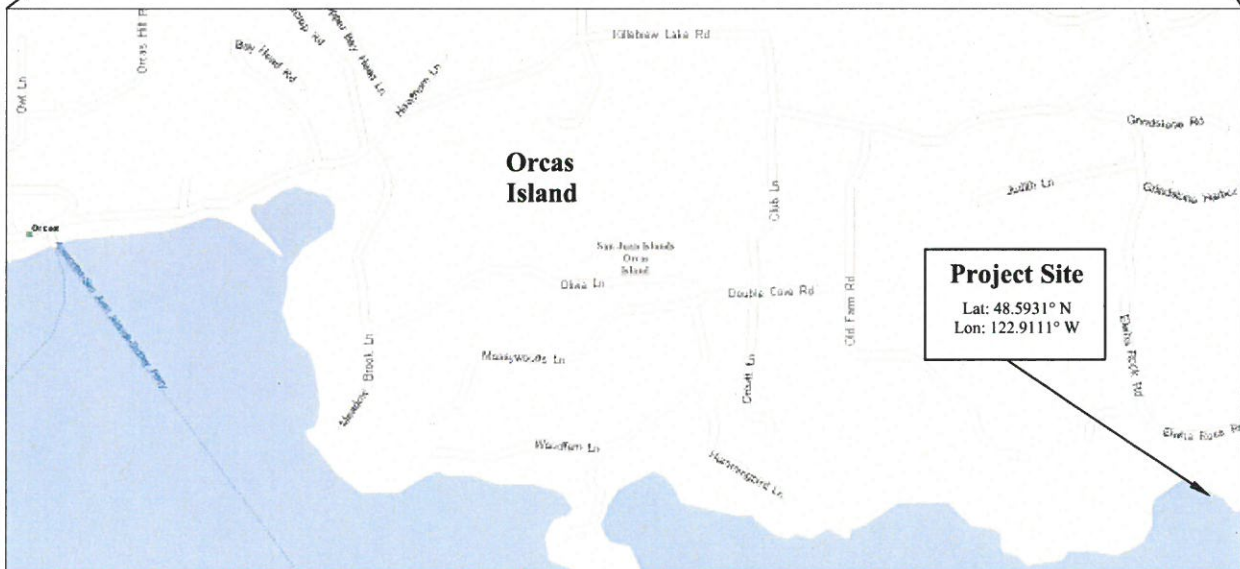
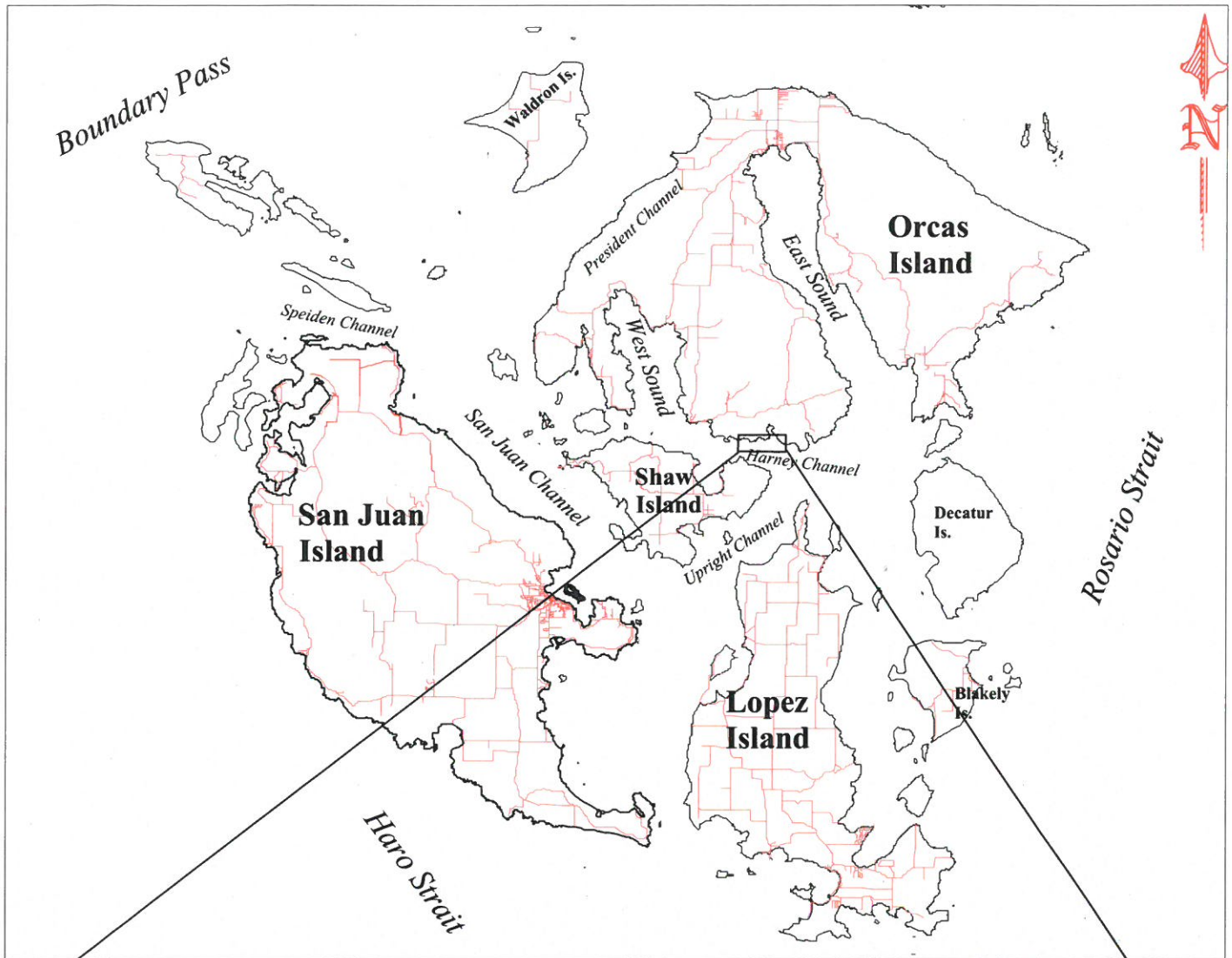
Existing Float System : 9' x 173' to be removed



Existing Breakwater (3) 64' sections to be removed



PROJECT LOCATION



Severson Dock Project

APPLICANT: TPN 262342006000
Cory Severson
227 18th Street
Huntington Beach, CA 92648

ADJACENT PROPERTIES:

1. Jeffrey & Mary Quinn TPN 262342008000
2439 Pine Street
San Diego, CA 92103-1041
2. Tom and Nancy Christie TPN 262331001000
2105 Via Visalia
Palos Verdes Est., CA 90274-2152

VICINITY MAP

Site Address: 330 Elwha Rock
Orcas, WA 98280
TPN# 262342006, Section 23,
Township 36N, Range 2W
LAT/LONG: 48.592613 N,
-122.910332 W

DATUM: N.O.S. MLLW=0'

SHEET: 1 of 6

PROPOSED: Existing Dock and
Breakwater Modification

IN: Harney Channel, Orcas Island

AT/NEAR: Harney Channel

COUNTY: San Juan County

STATE: WA

DATE: January 2015

REFERENCE: #

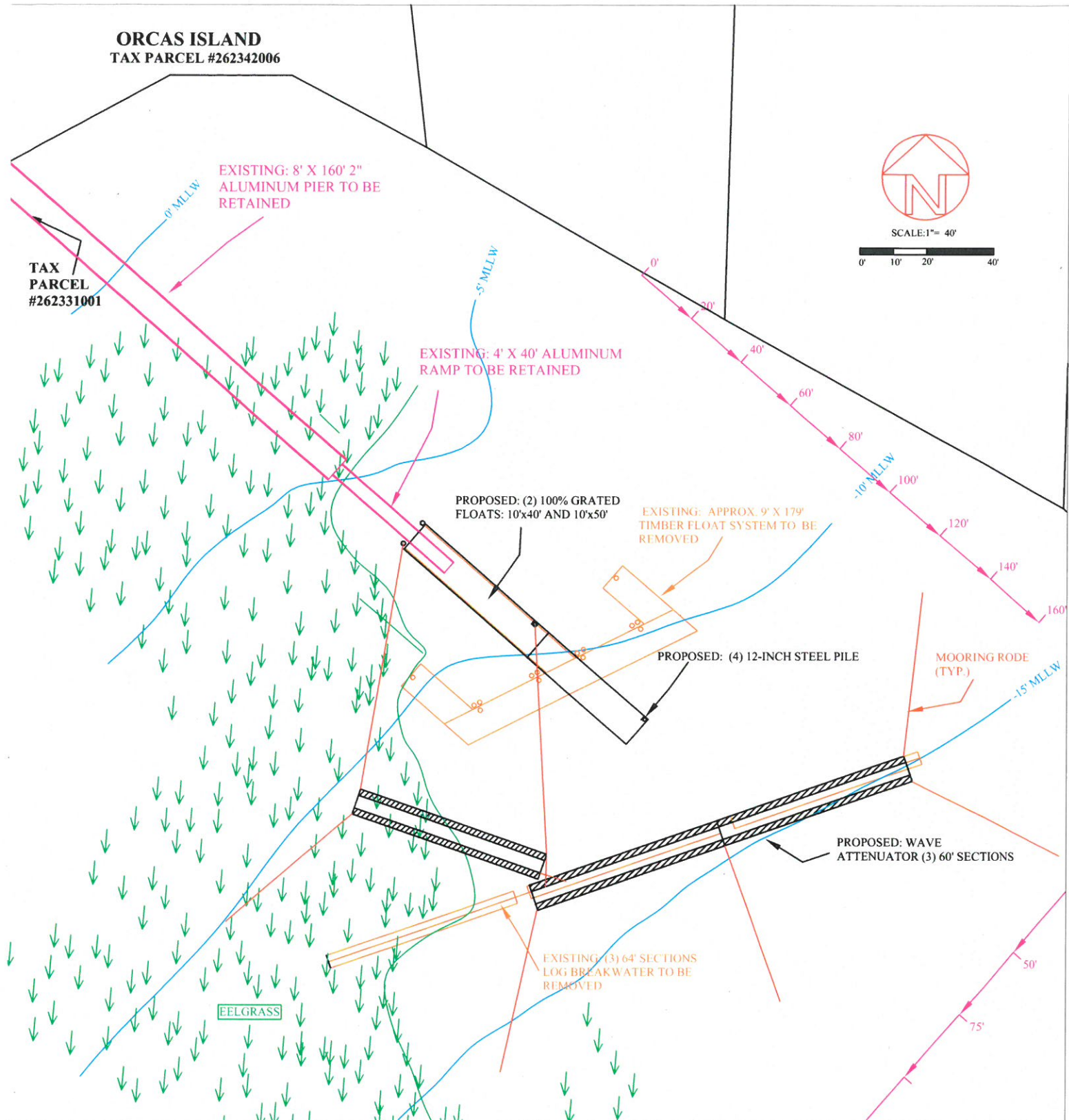
PROPOSED AND EXISTING DOCK SYSTEM

ORCAS ISLAND
TAX PARCEL #262342006

TAX PARCEL #262331001



SCALE: 1" = 40'



Severson Dock Project

APPLICANT: Cory Severson TPN 262342006000
17520 Newhope Street, Suite 120
Fountain Valley, CA 92708

1. Jeffrey & Mary Quinn TPN 262342008000
2439 Pine Street
San Diego, CA 92103-1041
2. Tom and Nancy Christie TPN 262331001000
2105 Vja Visalia
Palos Verdes Est., CA 90274-2152

SITE PLAN

Site Address: 330 Elwha Rock
Orcas, WA 98280
TPN# 262342006: Section 23,
Township 36N, Range 2W
LAT/LONG: 48.592613 N,
-122.910332 W

DATUM: N.O.S. MLLW=0'

SHEET: 2 of 6

PROPOSED: Existing Dock
Modification and
Breakwater Replacement

IN: Harney Channel, Orcas Island

AT/NEAR: Harney Channel

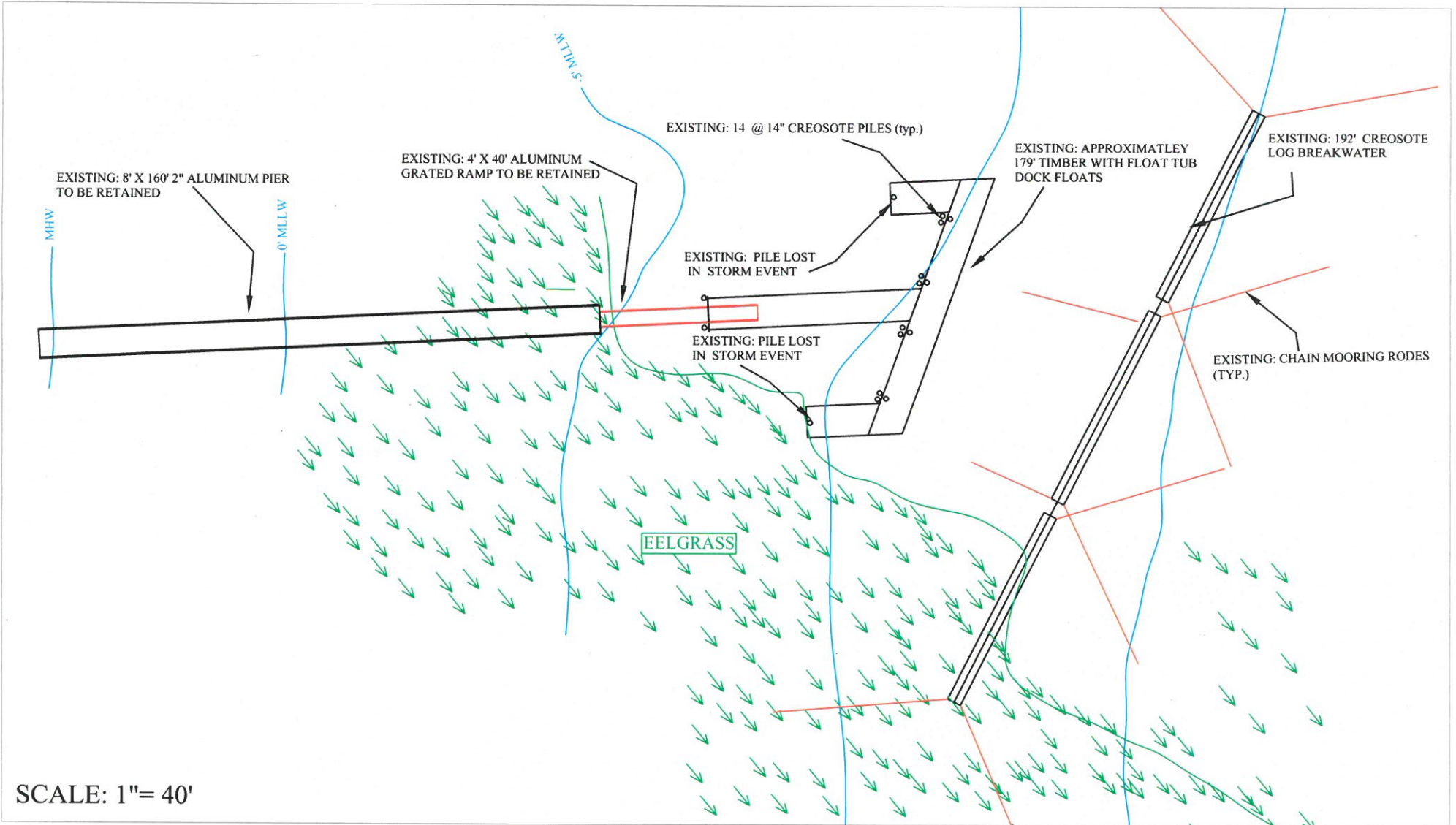
COUNTY: San Juan County

STATE: WA

DATE: January 2015 (Revised 2/15/16)

REFERENCE: #

EXISTING DOCK SYSTEM



SCALE: 1" = 40'

Severson Dock Project

EXISTING PLAN VIEW

APPLICANT: Cory Severson TPN 262342008000
17520 Newhope Street, Suite 120
Fountain Valley, CA 92708

1. Jeffrey & Mary Quinn TPN 262342008000
2439 Pine Street
San Diego, CA 92103-1041

2. Tom and Nancy Christie TPN 262331001000
2105 Via Visalia
Palos Verdes Est., CA 90274-2152

Site Address: 330 Elwha Rock
Orcas, WA 98280

TPN# 262342006: Section 23,
Township 36N, Range 2W
LAT/LONG: 48.592613 N,
-122.910332 W

DATUM: N.O.S. MLLW=0'

SHEET: 3 of 6

PROPOSED: Existing Dock and
Breakwater Modification

IN: Harney Channel, Orcas Island

AT/NEAR: Harney Channel

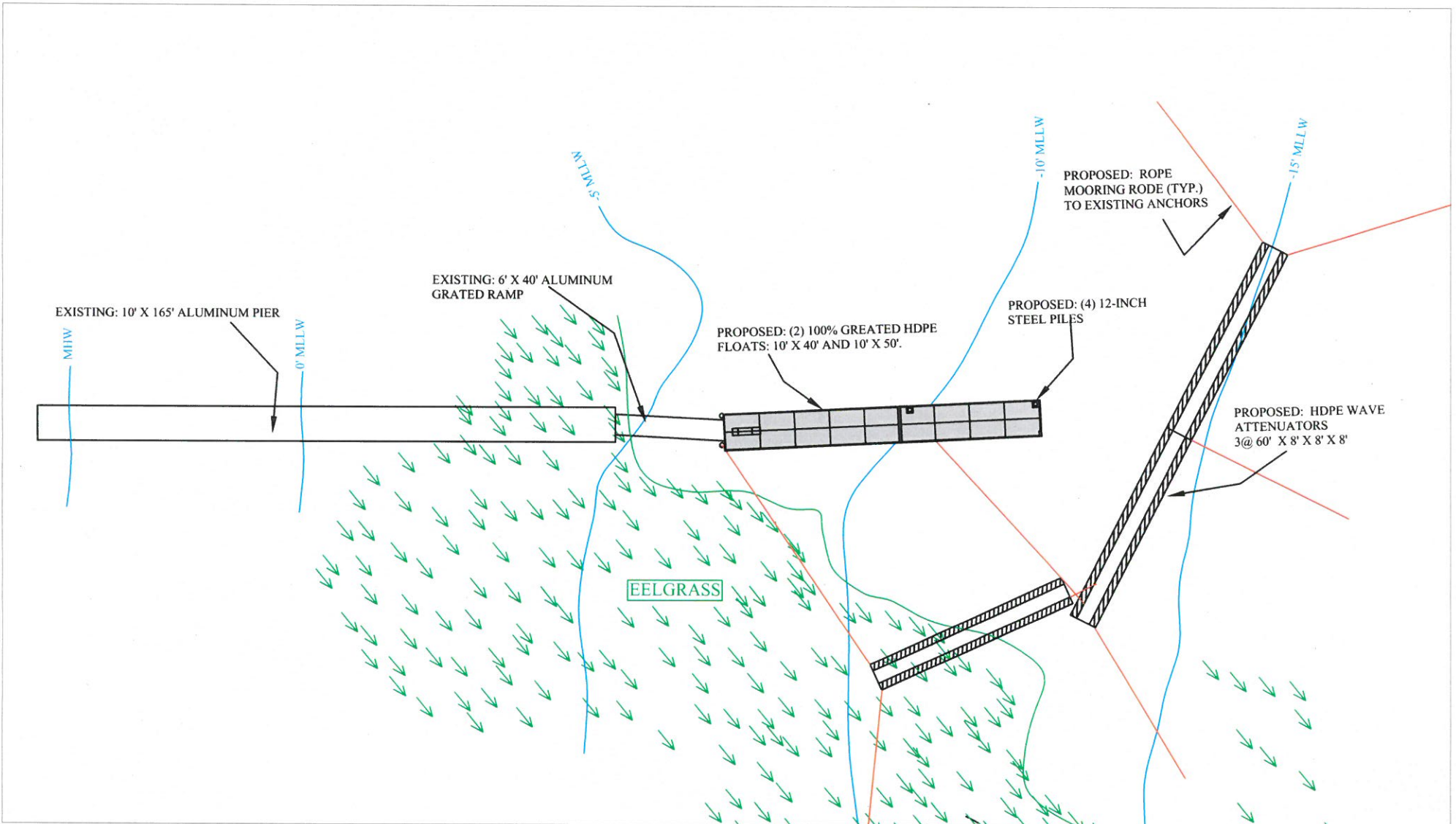
COUNTY: San Juan County

STATE: WA

DATE: January 2015 (revised 2/15/16)

REFERENCE: #

PROPOSED DOCK SYSTEM



Severson Dock Project

APPLICANT: TPN 262342006000
Cory Severson
227 18th Street
Huntington Beach, CA 92648

ADJACENT PROPERTY OWNERS:

1. Jeffrey & Mary Quinn TPN 262342008000
2439 Pine Street
San Diego, CA 92103-1041
2. Tom and Nancy Christie TPN 262331001000
2105 Via Visalia
Palos Verdes Est., CA 90274-2152

PLAN VIEW

Site Address: 330 Elwha Rock
Orcas, WA 98280
TPN# 262342006: Section 23,
Township 36N, Range 2W
LAT/LONG: 48.592613 N,
-122.910332 W

DATUM: N.O.S. MLLW=0'

SHEET: 4 of 6

PROPOSED: Existing Dock and
Breakwater Modification

IN: Harney Channel, Orcas Island

AT/NEAR: Harney Channel

COUNTY: San Juan County

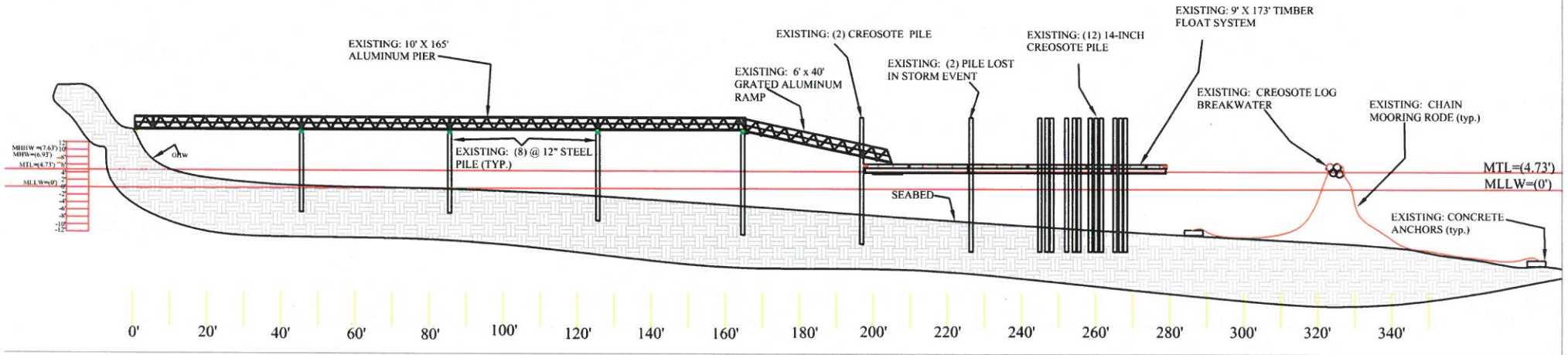
STATE: WA

DATE: January 2015

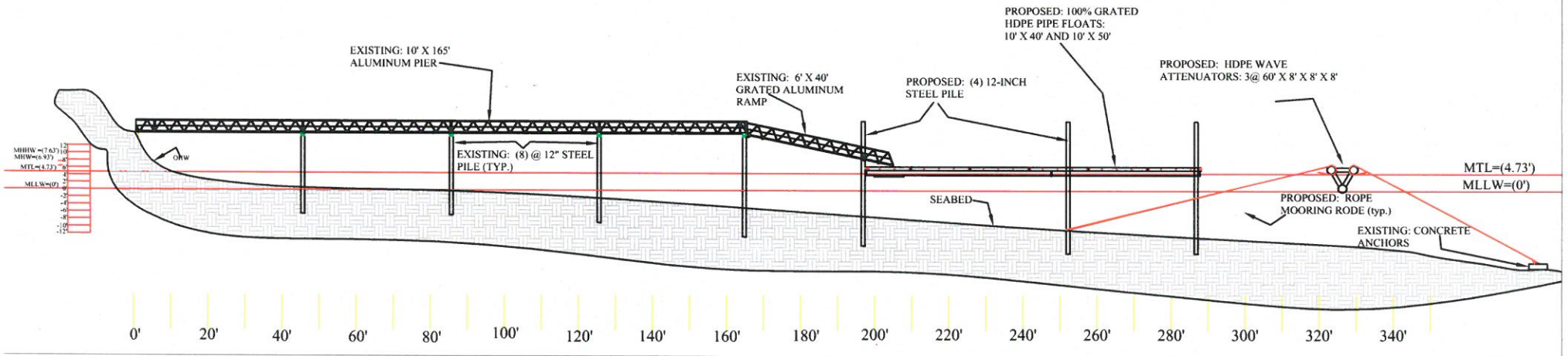
REFERENCE: #

SCALE: 1"= 40'

EXISTING



PROPOSED



Severson Dock Project

APPLICANT: TPN 262342006000
Cory Severson
227 18th Street
Huntington Beach, CA 92648

ADJACENT PROPERTY OWNERS:

1. Jeffrey & Mary Quinn TPN 262342008000
2439 Pine Street
San Diego, CA 92103-1041
2. Tom and Nancy Christie TPN 262331001000
2105 Via Visalia
Palos Verdes Est., CA 90274-2152

ELEVATION

Site Address: 330 Elwha Rock
Orcas, WA 98280
TPN# 262342006; Section 23,
Township 36N, Range 2W
LAT/LONG: 48.592613 N,
-122.910332 W

DATUM: N.O.S. MLLW=0'

SHEET: 5 of 6

PROPOSED: Existing Dock and
Breakwater Modification

IN: Harney Channel, Orcas Island

AT/NEAR: Harney Channel

COUNTY: San Juan County

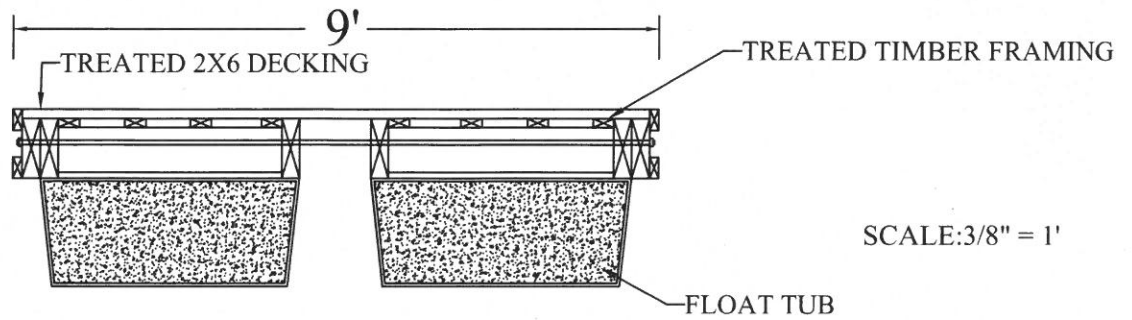
STATE: WA

DATE: January 2015

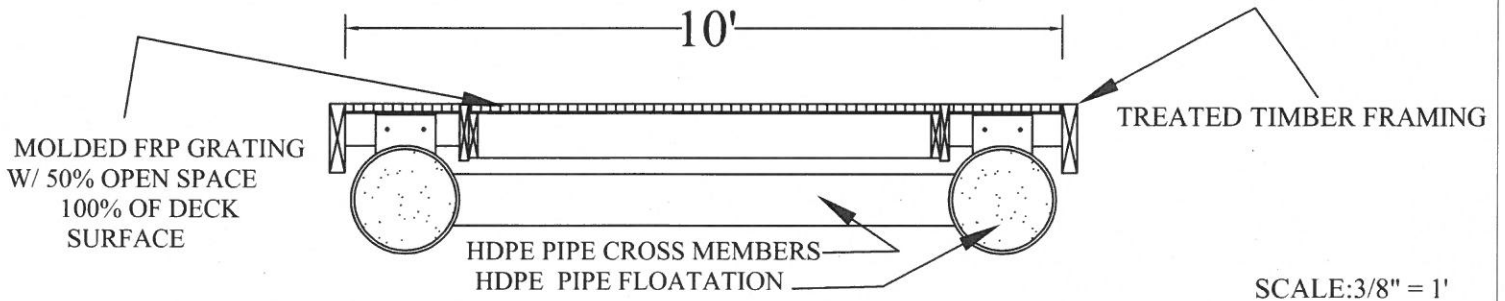
REFERENCE: #

SCALE: 1"= 40'

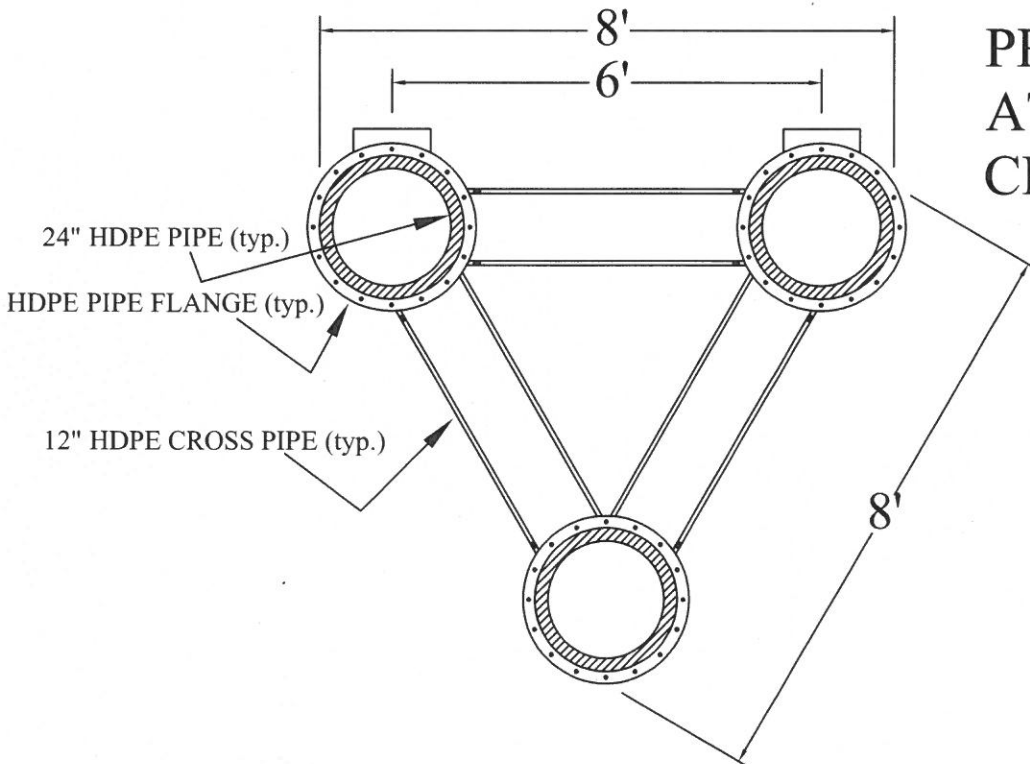
EXISTING FLOAT CROSS SECTION



PROPOSED FLOAT CROSS SECTION



PROPOSED WAVE ATTENUATOR CROSS SECTION



Severson Dock Project

APPLICANT: TPN 262342006000
Cory Severson
227 18th Street
Huntington Beach, CA 92648

ADJACENT PROPERTY OWNERS:

1. Jeffrey & Mary Quinn TPN 262342008000
2439 Pine Street
San Diego, CA 92103-1041
2. Tom and Nancy Christie TPN 262331001000
2105 Via Visalia
Palos Verdes Est., CA 90274-2152

CROSS SECTION

Site Address: 330 Elwha Rock
Orcas, WA 98280
TPN# 262342006: Section 23,
Township 36N, Range 2W
LAT/LONG: 48.592613 N,
-122.910332 W

DATUM: N.O.S. MLLW=0'

SHEET: 6 of 6

PROPOSED: Existing Dock and
Breakwater Modification
IN: Harney Channel, Orcas Island

AT/NEAR: Harney Channel

COUNTY: San Juan County

STATE: WA

DATE: January 2015

REFERENCE: #



JEN-JAY, INC.

Preliminary Eelgrass Macro Algae Habitat Survey
Cory Severson Dock Survey
13 September 2013

LOCATION: Harney Channel, Orcas Island, San Juan County.

PURPOSE: Repair and maintenance of a private joint-use dock and floating breakwater.

TIME: 10:00 a.m. to 1:30 p.m.

DEPTH CALCULATIONS: Measurements were made with a submersible electronic computer with the accuracy of +/- two feet. Corrections were made using the Port Townsend tide tables, corrected to Orcas, Orcas Island tide station #1207 with 0'=MLLW.

BOTTOM TYPE: A variation of mud plus zero to 10" rock, sandy mud, shelly mud or mud as shown on attached drawing.

VEGETATION: *Agarum*, *Chondracanthus*, *Cryptopleura*, *Fucus*, *Laminaria*, *Mastocarpus*, *Mazzella*, *Palmaria*, *Prionitis*, *Sargassum* and *Ulva* with zero to 30% cover as shown on attached drawing. *Zostera marina* (eelgrass) found in the survey area as shown on attached drawing.

SURVEY PATTERN: A line was ran down the centerline of the existing dock structure out past the seaward end of the float 80' to encompass the existing floating breakwater. Additional, parallel lines were run at 25', 50' and 75' to the northeast and 25', 50', 75', 100', 125', 150' and 175' to the southwest. These lines encompassed the existing floating breakwater and extended to an area for potentially shifting the floating breakwater to the southwest. All lines had 20' transects.

VISIBILITY: 15'±.

VERTEBRATE and INVERTEBRATE SPECIES: None with numbers enough to be significant.

FORAGE FISH: The shoreline in the +7' to +9' tidal zone has substrate that is potential forage fish habitat.

Any questions regarding this survey should be addressed to:

Chris Betcher
JEN-JAY DIVING, INC.

P.O. Box 278, Deer Harbor, WA 98243-0278

Ph: (360) 376-4664 Fax: (360) 376-6446 Boat: (360) 317-5373 Email: jenjay@rockisland.com

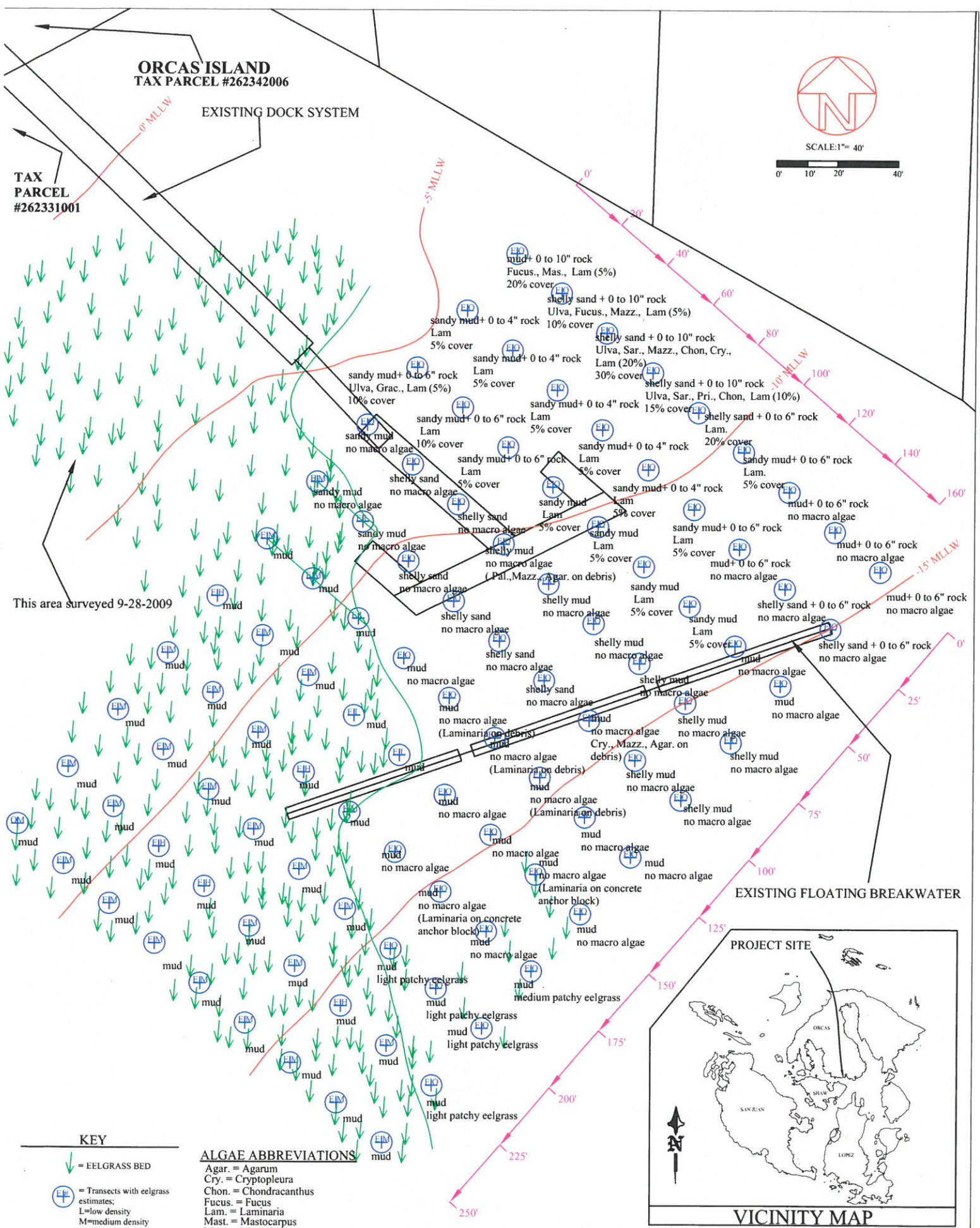
ORCAS ISLAND
TAX PARCEL #262342006

EXISTING DOCK SYSTEM

TAX PARCEL #262331001



SCALE: 1" = 40'



KEY

- ↓ = EELGRASS BED
- ⊕ = Transsects with eelgrass estimates; L=low density M=medium density H=high density 0=No eelgrass
- # MLLW = Contour lines corrected to 0=0' MLLW by Jen-Jay Diving Inc.

ALGAE ABBREVIATIONS

- Agar. = Agarum
- Cry. = Cryptopleura
- Chon. = Chondracanthus
- Fucus. = Fucus
- Lam. = Laminaria
- Mast. = Mastocarpus
- Mazz. = Mazzella
- Pal. = Palmaria
- Pri. = Prionitis
- Sar. = Sargassum
- Ulva. = Ulva

PRELIMINARY EELGRASS MACROALGAE HABITAT SURVEY
FOR: SEVERSON/CHRISTIE
BY: JEN-JAY INC.
DATE: SEPTEMBER 13, 2013

NOT CONSTRUCTION DRAWINGS
DEPTH CONTOURS AND ORIENTATION TO
LAND FEATURES ARE APPROXIMATE